regard to the adequacy with which each parent functions.

For this purpose he examined a group of eighty delinquent boys aged between twelve and fifteen in a London County Council Remand Home; he also examined a matched sample of eighty boys living at home, who had not been charged with any offence but who came from a similar social setting.

The boys were interviewed and asked a long series of questions about their impressions of how their parents behaved in showing affection, in communicating with them, and in the home generally; the children were also asked about their own conduct, their emotional reactions to stress, their habit training and experiences of separation from their parents. The mothers and fathers of thirty boys from each sample were interviewed and asked the same questions, suitably rephrased. The questions had been drawn up to test a number of hypotheses regarding the influence of parents on children.

In selecting his sample, Dr. Andry eliminated boys from broken homes, as well as boys who were regarded as neurotic, psychotic or mentally defective. The members of his delinquent group were all recidivist thieves.

Dr. Andry's findings indicate that in his sample, the behaviour of the father as perceived by the delinquent boy is frequently less satisfactory than the corresponding behaviour of the fathers of the non-delinquent boys, and could have been an important cause of the delinquency. The boys' experience of lack of affection, of contact with their parents, and of training reflected inadequacies in both parents but especially in the fathers. The delinquents did not differ significantly from the non-delinquents in the amount of physical separation from their mothers or from both parents, but the data were insufficient for deciding whether physical separation connoted psychological separation of parent from child.

Dr. Andry's book has the merit of stating his aims and technique clearly and of restricting his study to boys who had been remanded for repetition of one type of offence, stealing.

He thus avoids the error of some previous investigators who treated "delinquency" as a single abnormality. Dr. Andry is not writing about "delinquency" (in spite of his title) but about thieving by boys who were not neurotic or psychopathic, and who came from intact working class homes. He has made it easy for his technique to be used again on a much wider scale and for other types of offenders to be compared with his group.

His questionnaire, however, relies on the boys' subjective statements about their family relationships. Boys of the age studied are often unable to express their true feelings in answer to broad questions about parental affection; indirect and more specific inquiry is likely to yield more trustworthy information.

HILDA LEWIS

NATURAL SELECTION

Roberts, D. F. and **Harrison, G. A.** (Editors). *Natural Selection in Human Populations.* London, 1959. Pergamon Press, pp. viii + 76. Price 20s.

THE SIX PAPERS which make up this small volume were given at the Second Symposium of the Society for the Study of Human Biology. This Society was formed to serve as a meeting ground for research workers in the various branches of the study of the biology of human populations, especially human variability, human genetics and evolution, human adaption and ecology. Papers are, therefore, aimed at professional biologists in general, and the authors have all succeeded in being understandable by the reader who is not a full-time geneticist.

Professor L. S. Penrose deals with "Natural Selection in Man—Some Basic Problems", and the paper is particularly useful as a source of his personal opinion on several debatable points. He considers the impact of civilization, hygiene and modern medicine on natural selection, and, despite the demonstration in other species of the rapid changes in gene frequencies which can occur due to a change of environment, he infers that changes in gene frequencies are likely to be slow.

Dr. A. R. G. Owen in his paper on "Mathematical Models of Selection", considers the problem of the polymorphism of a series of more than two alleles. He demonstrates that equilibrium could be maintained, not only when the heterozygotes are fitter than all the homozygotes, but also when

some of the homozygotes are fitter than some of the heterozygotes. Even so, it appears that a heterosis principle is operating and that, for a polymorphism to exist, the fitness of each homozygote must be less than the average fitness of the population. This is a stimulating paper ending with a plea for a critical study of the validity of approximations based on the assumption of infinitesimally slow selection.

Dr. C. A. Clarke tackles the difficult problem of "The Relative Fitness of Human Mutant Genotypes", and with his knowledge, not only of the medical aspects of the subject, but also of the social habits of Man, he succeeds in producing a masterly survey of this subject. He describes the difficulties in assessing fitness and then discusses the fitness in eight diseases. He concludes that many dominant mutant genes have, anyhow at the present time, a fitness value of near unity, their rarity being explained by extremely low mutation rates. Light may be shed on the problem of the fitness of recessive genes by study of the heterozygous state, and the compulsory registration of abnormal traits would, he thinks, be valuable.

Dr. P. M. Sheppard's paper is entitled "Natural Selection and some Polymorphic Characters in Man". With his extensive experience of polymorphic systems in other species and his researches in Man, he is ideally suited to examine the available data concerning the effects of the different blood groups and other genetically determined characters on susceptibility to disease and fertility. It is, therefore, of interest that he concludes that the known selection pressures on the effects of the genes are not of sufficient magnitude to account for stable polymorphisms. Though he thinks their effects will be of a complex nature with the genes controlling several characters, he lists a number of lines of approach likely to reveal other and selectively more powerful effects.

Dr. Theodosius Dobzhansky takes the reader a stage further in modern genetic trends and deals with "Selection of Gene Systems in Natural Populations". He points out that since most characters in higher organisms are polygenically determined and epistatic interactions are prevalent, natural selection in Man may work with organized gene systems rather than with single discrete genes. In common with the other authors his arguments concerning evolutionary rates tend to minimize the importance of mutation rates and stress that of natural selection.

Dr. E. H. Ashton's paper on "The Rate of Change in Primate Evolution" is an excellent summary of the present state of knowledge. He considers that the earliest remains that can, with reasonable certainty, be assigned to *Homo sapiens*, date only from between 30,000 and 50,000 years ago, and his experience with the green monkey of St. Kitts shows that measurable amounts of change can occur in only 300 years. The fossil remains of the Primates, however, are as yet too few and fragmentary to form a basis for anything more than the most general deductions, and it is still uncertain whether or not the emergence of Man has been associated with any exceptionally rapid phases of evolutionary change.

This book can be highly recommended to those who want up-to-date authoritative accounts of the various aspects of natural selection, and the topical subject of the past and future evolution of Man.

R. B. MCCONNELL

EVOLUTION

Cameron, Thomas W. M. (Editor) *Evolution: Its Sciences and Doctrine*. Royal Society of Canada, "Studia Varia" Series 4. Toronto University Press, 1960. (London, Oxford University Press). Pp. xi + 242. Price 40s.

THIS IS ONE of the many volumes which have recently appeared from all parts of the world in recognition of the centenary of the publication of *On the Origin of Species*. The Royal Society of Canada commemorated the centenary by organizing a symposium on Evolution at its annual meeting in June, 1959, and the present volume is the standing memorial of that occasion. Some twenty papers by a diverse group of distinguished Canadians cover topics on geological, philosophical, sociological, zoological and cosmological subjects related to evolution.

Some of the papers are the work of specialists who are introducing their own subject to the public, and much of the book appears to have been edited with an educated public, rather than other specialists, in mind. The result is a number of excellent accounts on topics which range from